Claims

This listing of claims will replace all prior versions, and listings, of claims in the application: Listing of Claims:

- 1.-36. (Canceled)
- 37. (original) A vaccine preparation comprising at least one antigen and a molecule selected from the group consisting of
 - (a) a human β_2 -microglobulin molecule having a valine at position 55; and
- (b) a fusion protein comprising a first amino acid sequence and a second amino acid sequence, wherein the second amino acid sequence is a β_2 -microglobulin.
- 38. (original) A vaccine preparation according to claim 37(b) wherein the β_2 -microglobulin is h β_2 m S55V.
- 39. (original) A vaccine preparation according to claim 37 wherein the antigen is selected from the group consisting of bacterial, viral and tumor antigens.
- 40. (original) A method of vaccinating a mammal, comprising administering to the mammal a vaccine preparation according to claim 37.
- 41. (original) A method of vaccinating a mammal, comprising administering to the mammal an antigen and a microglobulin protein selected from the group consisting of:
 - (a) a human β_2 -microglobulin protein having a valine at position 55; and
- (b) a fusion protein comprising a first amino acid sequence and a second amino acid sequence, wherein the second amino acid sequence is a β_2 -microglobulin.
- 42. (currently amended) A method of stimulating a tumor-reactive cytotoxic T-cell response, comprising:
 - (a) isolating T-cells from a patient having a tumor;
 - (b) isolating tumor cells from the patient;

- (c) incubating the tumor cells with a fusion protein according to claim 4 comprising a first amino acid sequence and a second amino acid sequence, wherein the second amino acid sequence is a β_2 -microglobulin (β_2 m), such that wherein the β_2 m induces presentation of the fusion protein is presented on the surface of the tumor cells;
- (d) incubating the T-cells in the presence of the fusion protein-presenting tumor cells to increase the number of tumor-reactive T-cells; and
- (e) administering a therapeutically effective dose of the tumor-reactive T-cells to the patient.
- 43. (new) The method of claim 42, wherein the $\beta_2 m$ sequence is a wild-type $\beta_2 m$ sequence.
- 44. (new) The method of claim 42, wherein the β_2 m sequence is a modified β_2 m sequence that retains the ability to bind to an alpha chain of a class 1 MHC molecule.
- 45. (new) The fusion protein of claim 44, wherein the modified β_2 m sequence is a human β_2 -microglobulin ($h\beta_2$ m) S55V sequence.
- 46. (new) A fusion protein comprising a first amino acid sequence and a second amino acid sequence, wherein the first amino acid sequence is a cytokine, cell adhesion molecule, or CD40, and wherein the second amino acid sequence is a β_2 m.
- 47. (new) The fusion protein of claim 46, wherein the $\beta_2 m$ sequence is a wild-type $\beta_2 m$ sequence.
- 48. (new) The fusion protein of claim 46, wherein the β_2 m sequence is a modified β_2 m that retains the ability to bind to class 1 MHC molecules.
- 49. (new) The fusion protein of claim 48, wherein the modified β_2 m sequence is a human β_2 -microglobulin ($h\beta_2$ m) S55V sequence.

- 50. (new) The fusion protein of claim 46, wherein the cytokine is interleukin-2 (IL-2), interleukin-12 (IL-12), granulocyte-macrophage colony-stimulating factor (GM-CSF), or tumor necrosis factor (TNF)-alpha.
- 51. (new) The fusion protein of claim 46, wherein the cell adhesion molecule is VCAM-1.
- 52. (new) The fusion protein of claim 46, wherein the first amino acid sequence is joined to the second amino acid sequence.
- 53. (new) The fusion protein of claim 52, wherein the first amino acid sequence is joined to an amino terminus of the second amino acid sequence.
- 54. (new) The fusion protein of claim 52, wherein the first and second sequences are linked by a peptide linker.
- 55. (new) The fusion protein of claim 46, wherein the fusion protein further comprises a signal peptide joined to an amino terminus of the first amino acid sequence.
- 56. (new) The fusion protein of claim 55, wherein the signal peptide is a β_2 m signal peptide.
 - 57. (new) A recombinant nucleic acid molecule encoding the protein of claim 46.
 - 58. (new) A vector comprising the recombinant nucleic acid molecule of claim 57.
- 59. (new) A transgenic cell comprising the recombinant nucleic acid molecule of claim 57.

- 60. (new) A cell having a cell membrane comprising the fusion protein of claim 46.
- 61. (new) A method of enhancing the immune response of a mammal to an antigen presented on the surface of a cell, the method comprising:

contacting the cell with the fusion protein of claim 46 such that the fusion protein is presented on the surface of the cell; and

administering the cell to a mammal.

- 62. (new) The method of claim 61, wherein the cell is a tumor cell.
- 63. (new) A method of enhancing the immune response of a mammal to an antigen presented on the surface of a cell, the method comprising:

transforming the cell with the recombinant nucleic acid molecule of claim 57, such that expression of the nucleic acid molecule results in expression of a fusion protein encoded by the nucleic acid molecule being presented on the surface of the cell; and

administering the cell to a mammal.

64. (new) The method of claim 63, wherein the cell is a tumor cell.